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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/148,723    09/03/98    FARNWORTH

W    MI22-981

EXAMINER

021567

QM12/1209

WELLS ST JOHN ROBERTS GREGORY AND MATKIN  
SUITE 1300

601 W FIRST AVENUE  
SPOKANE WA 99201-3828

ART UNIT 100BANGS  
PAPER NUMBER

*9*

DATE MAILED: 3729

12/09/99

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

12-9-99

**Office Action Summary**Application No.  
**09/148,723**Applicant  
**Farnworth et al**Examiner  
**A. Dexter Tugbang**Group Art Unit  
**3729**☒ Responsive to communication(s) filed on Oct 26, 1999☐ This action is **FINAL**.☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

**Disposition of Claims**☒ Claim(s) 1-41 is/are pending in the application.Of the above, claim(s) 4, 5, 7, 9, 10, 14-19, 21, 25, 28, 32-35, and 38-41 is/are withdrawn from consideration.☐ Claim(s) \_\_\_\_\_ is/are allowed.☒ Claim(s) 1-3, 6, 8, 11-13, 20, 22-24, 26, 27, 29-31, 36, and 37 is/are rejected.☐ Claim(s) \_\_\_\_\_ is/are objected to.☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.**Application Papers**☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.☐ The specification is objected to by the Examiner.☐ The oath or declaration is objected to by the Examiner.**Priority under 35 U.S.C. § 119**☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☐ received.☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).**Attachment(s)**☒ Notice of References Cited, PTO-892☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 3☐ Interview Summary, PTO-413☒ Notice of Draftsperson's Patent Drawing Review, PTO-948☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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### DETAILED ACTION

1. The applicants' Corrected Filing Receipt to change the filing date of the application has been considered and entered.

#### *Election/Restriction*

2. Applicant's election without traverse of the invention of Group I, Species F, in Paper No. 5 is acknowledged.
3. Claims 42-44, 4, 5, 7, 9, 10, 14-19, 21, 25, 32-35, 38, 28 and 39-41 have been withdrawn from further consideration by the examiner, 37 CFR 1.142(b) as being drawn to a non-elected invention of Group II and Group I, Species A, B, C, D, E and G. Election was made **without** traverse in Paper No. 6. It is noted that Claim 41 has been Grouped with Species C (independent Claim 39) which has been drawn to the non-elected invention.

#### *Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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5. Claims 1 and 2 are rejected under 35 U.S.C. 102(a) as being clearly anticipated by the publication to Kasulke et al, "Solder Ball Bumper (SSB) - A Flexible Equipment for FC, CSP, BGA, and Printed Circuit Boards". It is noted that the applicants' have not provided the publication date to Kasulke et al and if the publication date to Kasulke et al is found to be more than one year prior to the applicants' filing date, Claims 1 and 2 would be rejected under 35 U.S.C. 102(b).

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 3, 11, 12, 13, 27, 29 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Desai et al 5,479,703.

Desai discloses a method of bonding solder balls to bond pads including: placing a plurality of solder balls 25 (in fig. 9) withing a frame (ball dispenser 100) having holes in registered alignment with individual bond pads (conductive material 23) over a substrate (dielectric 36); and exposing the solder balls to a reflowing process by the use of a vapor phase machine (discussed at col. 10, lines 1-30) to effect bonding of the solder balls, which <sup>meets</sup> all of the limitations of the claimed invention.

Regarding claim 22, Desai further teaches moving the frame by vibration to position the balls within the holes and effectuate bonding (discussed at col. 9, lines 50-53).

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***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2, 6, 8, 20, 22-24, 26, 30, 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desai et al in view of Kasulke et al.

Desai teaches a method of bonding solder balls as previously discussed. Desai does not teach bonding the solder balls by laser-bonding with a laser beam.


The publication to Kasulke teaches a laser-bonding apparatus with a laser beam (shown in Figures 2 and 3) to reflow the solder ball and effect bonding (discussed at page 2) and it would have been obvious to one having ordinary skill in the art at the time the invention was made to have substituted the laser-bonding apparatus of Kasulke, for the vapor phase machine of Desai, to perform such reflowing of the solder balls and effect bonding.

***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dexter Tugbang whose telephone number is (703) 308-7599.

  
12/6/99  
LEE YOUNG  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3700

ADT

December 6, 1999